



Job Number: SVGJ-160140
 Company: PDC
 Lease/Well: J&L Farms 23-12
 Location: Weld County, CO
 Rig Name: MS Slickline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.35°
 Grid: East To True North
 File name: W:\2016\PDC\GJ\J&LFAR~1\2312.SVY
 Date/Time: 31-Mar-16 / 11:23
 Curve Name: Surface - 6800' M.D. (Rate Gyro)
 Lat: 40.47317 Long: -104.52519

MS Survey

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane .00
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

<i>Measured Depth FT</i>	<i>Incl Angle Deg</i>	<i>Drift Direction Deg</i>	<i>True Vertical Depth</i>	<i>N-S FT</i>	<i>E-W FT</i>	<i>Vertical Section FT</i>	<i>C L O S U R E</i>		<i>Dogleg Severity Deg/100</i>
							<i>Distance FT</i>	<i>Direction Deg</i>	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.40	321.69	100.00	.27	-.22	.27	.35	321.69	.40
200.00	.09	308.21	200.00	.60	-.49	.60	.77	320.34	.31
300.00	.08	8.18	300.00	.71	-.55	.71	.90	322.58	.09
400.00	.17	202.03	400.00	.65	-.59	.65	.88	317.48	.25
500.00	.53	190.26	500.00	.05	-.73	.05	.73	274.15	.37
600.00	.58	198.43	599.99	-.88	-.97	-.88	1.31	227.78	.09
700.00	.53	198.23	699.99	-1.80	-1.28	-1.80	2.21	215.33	.05
800.00	.52	203.33	799.98	-2.66	-1.60	-2.66	3.10	211.07	.05
900.00	.57	206.90	899.98	-3.52	-2.01	-3.52	4.05	209.70	.06
1000.00	.66	204.00	999.97	-4.49	-2.47	-4.49	5.12	208.78	.10
1100.00	.65	200.37	1099.97	-5.55	-2.90	-5.55	6.26	207.58	.04
1200.00	.55	204.16	1199.96	-6.52	-3.29	-6.52	7.30	206.80	.11

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
1300.00	.52	221.44	1299.96	-7.29	-3.79	-7.29	8.22	207.45	.16
1400.00	.57	231.48	1399.95	-7.94	-4.48	-7.94	9.12	209.41	.11
1500.00	.56	228.31	1499.95	-8.58	-5.23	-8.58	10.05	211.38	.03
1600.00	.44	237.85	1599.94	-9.11	-5.92	-9.11	10.86	213.03	.15
1700.00	.47	240.39	1699.94	-9.51	-6.60	-9.51	11.58	214.76	.04
1800.00	.42	240.06	1799.94	-9.90	-7.28	-9.90	12.29	216.32	.05
1900.00	.11	275.17	1899.94	-10.07	-7.69	-10.07	12.67	217.36	.34
2000.00	.58	91.96	1999.93	-10.08	-7.28	-10.08	12.44	215.83	.69
2100.00	.63	103.42	2099.93	-10.23	-6.24	-10.23	11.98	211.39	.13
2200.00	.58	133.76	2199.92	-10.71	-5.34	-10.71	11.96	206.51	.32
2300.00	.59	189.52	2299.92	-11.56	-5.06	-11.56	12.62	203.63	.55
2400.00	.97	202.65	2399.91	-12.85	-5.47	-12.85	13.97	203.06	.42
2500.00	1.10	202.38	2499.89	-14.52	-6.16	-14.52	15.77	202.99	.13
2600.00	1.10	198.13	2599.87	-16.32	-6.83	-16.32	17.69	202.70	.08
2700.00	.85	190.94	2699.86	-17.96	-7.27	-17.96	19.38	202.02	.28
2800.00	.88	195.63	2799.85	-19.43	-7.61	-19.43	20.87	201.40	.08
2900.00	.87	203.61	2899.84	-20.86	-8.12	-20.86	22.39	201.27	.12
3000.00	.57	230.69	2999.83	-21.88	-8.81	-21.88	23.58	201.94	.45
3100.00	.57	252.19	3099.82	-22.34	-9.67	-22.34	24.35	203.41	.21
3200.00	.41	251.76	3199.82	-22.61	-10.48	-22.61	24.92	204.88	.16
3300.00	.71	223.85	3299.82	-23.17	-11.25	-23.17	25.75	205.91	.40
3400.00	.45	195.61	3399.81	-23.99	-11.79	-23.99	26.73	206.17	.38
3500.00	.32	155.52	3499.81	-24.62	-11.78	-24.62	27.29	205.56	.29
3600.00	.26	129.70	3599.81	-25.02	-11.49	-25.02	27.53	204.66	.14
3700.00	.51	140.82	3699.81	-25.51	-11.03	-25.51	27.79	203.39	.26
3800.00	.45	142.66	3799.80	-26.17	-10.51	-26.17	28.20	201.89	.06
3900.00	.58	157.85	3899.80	-26.95	-10.08	-26.95	28.77	200.51	.19
4000.00	.59	153.79	3999.79	-27.88	-9.67	-27.88	29.51	199.12	.04
4100.00	.38	137.06	4099.79	-28.59	-9.21	-28.59	30.03	197.86	.25
4200.00	.48	102.62	4199.79	-28.92	-8.58	-28.92	30.16	196.52	.27
4300.00	.50	80.22	4299.78	-28.94	-7.74	-28.94	29.95	194.97	.19
4400.00	.53	87.72	4399.78	-28.84	-6.85	-28.84	29.65	193.35	.07
4500.00	.49	79.29	4499.77	-28.75	-5.96	-28.75	29.36	191.72	.08
4600.00	.41	83.11	4599.77	-28.62	-5.19	-28.62	29.09	190.28	.09

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
4700.00	1.00	102.84	4699.76	-28.78	-3.98	-28.78	29.05	187.88	.63
4800.00	1.16	99.44	4799.75	-29.14	-2.13	-29.14	29.21	184.19	.17
4900.00	1.02	93.13	4899.73	-29.35	-.25	-29.35	29.35	180.48	.18
5000.00	.95	91.84	4999.71	-29.42	1.47	-29.42	29.46	177.14	.07
5100.00	.87	80.65	5099.70	-29.33	3.05	-29.33	29.49	174.07	.19
5200.00	.30	88.03	5199.69	-29.20	4.06	-29.20	29.48	172.09	.57
5300.00	.18	267.32	5299.69	-29.19	4.16	-29.19	29.49	171.88	.48
5400.00	.58	233.58	5399.69	-29.50	3.60	-29.50	29.72	173.04	.44
5500.00	1.15	222.40	5499.68	-30.54	2.52	-30.54	30.65	175.29	.59
5600.00	1.15	218.64	5599.66	-32.07	1.21	-32.07	32.09	177.84	.08
5700.00	1.20	172.13	5699.64	-33.89	.73	-33.89	33.90	178.77	.93
5800.00	1.42	152.20	5799.62	-36.02	1.45	-36.02	36.05	177.69	.50
5900.00	1.04	180.41	5899.59	-38.03	2.02	-38.03	38.08	176.96	.70
6000.00	1.11	194.95	5999.58	-39.87	1.77	-39.87	39.91	177.46	.28
6100.00	1.16	207.27	6099.56	-41.71	1.05	-41.71	41.72	178.56	.25
6200.00	.72	236.83	6199.54	-42.95	.06	-42.95	42.95	179.92	.64
6300.00	.90	242.51	6299.53	-43.66	-1.16	-43.66	43.67	181.52	.20
6400.00	1.73	275.11	6399.51	-43.88	-3.36	-43.88	44.01	184.38	1.09
6500.00	3.08	282.06	6499.42	-43.19	-7.49	-43.19	43.83	189.84	1.38
6600.00	5.62	297.00	6599.12	-40.40	-14.48	-40.40	42.92	199.72	2.76
6700.00	3.12	317.25	6698.83	-36.18	-20.69	-36.18	41.68	209.77	2.90
Last Survey Depth Recorded									
6800.00	2.66	349.46	6798.71	-31.90	-22.97	-31.90	39.31	215.75	1.66